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WOODS USED FOR PACKING BOXES IN NEW ENGLAND.

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New England is preeminently a manufacturing region. Scarcely a river reaches the ocean without being called upon to turn hundreds of wheels in different industries. It would be hard to name an article made of cotton, wood, wool, leather, or metal which, to some extent at least, is not manufactured within its borders. To ship the great bulk of these products there is needed each year an enormous number of packing boxes. Practically all of the wood used in the manufacture of such boxes is obtained locally, and of late years a shortage of lumber suitable for the purpose has confronted the New England box manufacturer. So acute in some instances has this shortage become that box factories have been compelled to close down. In other cases, where the decrease in the local supply of timber is less pronounced, the shortage elsewhere has forced up the price until the manufacturer must either advance the price of his boxes or take lower profits.

The figures contained in this circular were compiled by the Forest Service from answers to questions sent to box manufacturers throughout New England concerning the consumption of lumber in 1905.

WOODS USED.

That white pine is easily the leading box material of New England is shown in Table 1, which gives for 344 box factories in the six New England States the kind and quantity of lumber used in 1905. Of a total consumption of 600,493,000 board feet, white pine furnished 81.8 per cent, or more than four times as much as all other kinds combined. Spruce, which makes an excellent box and which is handled exclusively by a few factories, comes next with 9.9 per cent. It is largely used in the manufacture of butter boxes. Hemlock follows with 4.3 per cent; beech, birch, and maple combined with 1.5 per

cent; fir with 1.3 per cent; and all other kinds with less than 1 per cent each. Chestnut, hemlock, and pitch pine are often worked up into large dry-goods boxes with white pine. It is not uncommon to find all four of these woods in one box. Beech, birch, and maple are put into boxes together without distinction. Basswood is made chiefly into small boxes, its scarcity and cost limiting its use.

Practically all of the timber used for boxes in New England is second growth. It is not sorted into grades when sawed, but is usually sent to the factory as round-edge lumber, or with the bark remaining on the edges of the boards. In this way considerable waste is avoided.

TABLE 1.—*Kind and quantity of wood used in 344 box factories in New England in 1905.*

Kind of wood.	Massachusetts (138 factories).	New Hampshire (57 factories).	Maine (72 factories).	Vermont (56 factories).	Connecticut (16 factories).	Rhode Island (5 factories).	Total (344 factories).	Per cent.
	Thousand board ft.	*Thousand board ft.*	*Thousand board ft.*	*Thousand board ft.*	*Thousand board ft.*	*Thousand board ft.*	*Thousand board ft.*	
White pine	265,136	110,192	74,612	21,419	10,065	9,878	491,302	81.8
Spruce	10,648	3,583	29,691	12,872	2,353	207	59,354	9.9
Hemlock	9,813	10,131	3,465	1,846	590	100	25,945	4.3
Beech, birch, and maple	117	156	6,702	1,467	.....	.....	8,442	1.5
Fir	1,000	25	6,929	10	.....	.....	7,964	1.3
Poplar	1,160	282	310	493	184	500	2,929	.5
Chestnut	1,455	185	.....	.....	31	150	1,821	.3
Basswood	45	70	884	95	.....	.....	1,094	.2
Other woods	852	50	.....	70	214	456	1,642	.2
Total	290,226	124,674	122,593	38,272	13,437	11,291	600,493	100.0

Table 1 shows also that of the six New England States Massachusetts manufactures by far the largest number of packing boxes. One hundred and thirty-eight factories in Massachusetts used in 1905 290,226,000 feet of lumber, or nearly as much as the five other States combined. New Hampshire and Maine utilized nearly equal quantities of lumber for boxes, 57 factories in the former State reporting 124,674,000 feet and 72 factories in the latter 122,593,000 feet. In Vermont, 56 factories used 38,272,000 feet of lumber; in Connecticut, 16 factories used 13,437,000 feet; and in Rhode Island, 5 factories used 11,291,000 feet.

The cost, delivered at the factory, of the different kinds of lumber used in 1905 is given in Table 2. The total cost reported was $7,871,500, and of this white pine comprises $6,463,500, or 82.1 per cent. The average cost per thousand feet for each species was: Basswood, $16.22; chestnut, $15.70; beech, birch, and maple, $15.66; poplar, $14.61; white pine, $13.15; spruce, $12.78; hemlock, $12.06; fir, $11.37; other woods, $14.95.

TABLE 2.—*Value of wood used in 344 box factories in New England in 1905.*

Kind of wood.	Massachusetts.	New Hampshire.	Maine.	Vermont.	Connecticut.	Rhode Island.	Total.	Per cent.
White pine	$3,446,800	$1,432,500	$895,300	$364,100	$181,200	$143,600	$6,463,500	82.1
Spruce	181,000	46,600	326,600	160,900	40,000	3,500	758,600	9.6
Hemlock	127,600	121,600	34,600	19,400	8,300	1,400	312,900	4.0
Beech, birch, and maple	1,900	1,700	113,900	14,700	.....	.....	132,200	1.7
Fir	14,000	300	76,200	100	.....	.....	90,600	1.2
Poplar	18,600	3,900	2,800	4,900	2,600	10,000	42,800	.5
Chestnut	23,300	3,000	.....	.....	400	1,900	28,600	.4
Basswood	900	1,500	14,000	1,300	.....	.....	17,700	.2
Other woods	12,700	800	.....	1,100	3,200	6,800	24,600	.3
Total	3,826,800	1,611,900	1,463,400	566,500	235,700	167,200	7,871,500	100.0

WHITE PINE AS A BOX MATERIAL.

The preponderance of white pine in the manufacture of packing boxes in New England is only partly due to the fact that it is one of the chief forest trees of the region. Wood to be suitable for high-grade box making must be strong and tough, so that it can be utilized without splitting; light, to facilitate handling and lessen freight charges; odorless, so that it will not taint the contents of the box; and preferably light in color. White pine largely fulfills all of these conditions, and in addition it seasons well and is easily worked. Thus, for the box maker, it is an ideal wood and the New England manufacturer would be hard pressed to find a suitable substitute.

LIFE OF A PACKING BOX.

The life of a packing box is very short. As a rule a box reaches its destination in as good condition as when it left the factory, but once it has served its original purpose it is broken up and burned. Many millions of feet of lumber annually go out from New England in the form of packing boxes, which after a few weeks are destroyed. Recently the life of many packing boxes has been doubled by remodeling them for further use, but this practice has not yet become common.

THE FUTURE SUPPLY OF LUMBER.

Though a severe shortage of second growth white pine in New England is not imminent, the decrease in supply will undoubtedly continue for some time, and, unless vigorous measures are taken to meet the shortage, will become permanent. Within recent years increased attention has been paid to forest planting, and, furthermore, it is probable that through natural extension on abandoned fields more land in New England supports a young growth of white pine to-day than for many years past. This will not immediately

benefit the manufacturer, however, since it requires from thirty-five to forty years for planted white pine to reach a profitable size. In the meantime the manufacturer may be compelled to look elsewhere for his supply of lumber or to curtail largely his output. If the cut of the available stand continues at the present rate, the supply will surely be exhausted before the new growth reaches a marketable size.

Table 3 illustrates the possibilities of forest growth in the different New England States. Less than 20 per cent of the area of the six States is farm land; much of the remainder is either forested or capable of producing timber. The 10,000,000 acres of waste land, which at present is yielding little or no return, if forested and properly managed, would eventually yield each year more lumber than the entire cut of white pine in New England in 1905.

TABLE 3.—*Area of farm, forest, brush, and waste land in New England.*

State.	Total land area.	Improved land area (farms).	Probable forest area.	Brush and waste area.
	Acres.	*Acres.*	*Acres.*	*Acres.*
Maine	19,132,000	2,386,000	12,244,000	4,302,000
Vermont	5,846,000	2,126,000	2,455,000	1,265,000
New Hampshire	5,783,000	1,076,000	3,586,000	1,121,000
Massachusetts	5,155,000	1,292,000	1,495,000	2,368,000
Connecticut	3,100,000	1,064,000	899,000	1,137,000
Rhode Island	694,000	187,000	277,000	230,000
Total	39,710,000	8,131,000	20,956,000	10,423,000

The box makers of New England depend for their supply of lumber mainly upon farmers' woodlots. It is important for the future of the box-making industry, however, that they should secure and properly manage sufficient forest land to furnish a considerable part of their supply. Land now producing pine can be made to produce more. Other land which now bears a growth of inferior trees can be made to produce pine. Suggestions for increasing the supply of white pine in New England are given in Bulletin 45 of the Forest Service, The Planting of White Pine in New England, and Bulletin 63, The Natural Replacement of White Pine on Old Fields in New England.

Approved.

JAMES WILSON,

Secretary.

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